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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,327	09/27/2006	Ryoji Noyori	129542	3317
25944 7590 12/17/2010 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
KEYS, ROSALYND ANN				
ART UNIT		PAPER NUMBER		
1621				
NOTIFICATION DATE		DELIVERY MODE		
12/17/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com  
jarnstrong@oliff.com

### Office Action Summary

**Application No.**

10/594,327

**Applicant(s)**

NOYORI ET AL.

**Examiner**

Rosalynd Keys

**Art Unit**

1621

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 September 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-19, 21-25, 27, 28 and 30-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-19, 21-25, 27, 28, and 30-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Status of Claims***

1. Claims 11-19, 21-25, 27, 28, and 30-33 are pending.

Claims 11-19, 21-25, 27, 28, and 30-33 are rejected.

Claims 1-10, 20, 26 and 29 are cancelled.

***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 15, 2010 has been entered.

***Election/Restrictions***

3. Applicant's election without traverse of claims 11, 13, 17, 20, 23, 26, and 29 in the reply filed on May 16, 2008 is acknowledged.
4. Claims 12, 14-16, 18, 19, 21, 22, 24, 25, 27, 28, 30 and 31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 16, 2008.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 11, 13, 17, 23, 32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (US 6,686,505 B2) in view of Ikariya et al. (JP 11-189600)

Applicants claim a process for producing an optically active alcohol comprising placing a metal complex represented by general formula (1) and a ketone compound in a polar solvent and without the presence of a base and stirring the mixture under pressurized hydrogen to hydrogenate the ketone compound to thereby obtain an optically active alcohol.

**Determination of the scope and content of the prior art**  
**(MPEP §2141.01)**

Watanabe et al. teach use of a complex prepared in advance from an optically active nitrogen-containing compound and a compound of a metal belonging to group VIII of the periodic table in a process for the production of an optically active amino alcohol comprising reacting a ketone compound in the presence or absence of a base with a hydrogen donor (see entire disclosure, in particular column 3, line 59 to column 7, line 18). Examples of complexes in which the optically active nitrogen-containing compound coordinates to the metal atom belonging to group VIII of the periodic table include a chloride complex, an amide complex, a hydride complex, etc. (see column 20, line 35 to column 21, line 55). Suitable examples of the

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hydrogen donor include alcohol compounds having a hydrogen atom at the  $\alpha$ -position such as methanol and ethanol (see column 21, lines 56-60). It is taught that the hydrogen donors can be used in combination (see column 21, lines 60-62). It is taught that the asymmetric reduction reaction may be carried out in the absence of a base when an alcohol such as 2-propanol is used as the hydrogen donor (see column 22, lines 16-18). It is taught that normally the hydrogen donor itself is used as the reaction solvent (see paragraph 22, lines 42-43). Ketones suitable for starting materials include those of the claimed invention (see column 8, line 60 to column 18, line 13).

Ikariya et al. teach that it is known in the art that asymmetric hydrogenation of carbonyl compound (which includes a ketone) can be accomplished using pressurized hydrogen or a hydrogen donor in the presence or absence of a base and a ruthenium complex. (See entire computer generated English translation, in particular paragraphs 0015; 0040-0043 and claims 21-32 and 33). In paragraph 0042 alcoholic solvents, such as ethanol are taught to be useful as reaction solvents.

#### **Ascertainment of the difference between the prior art and the claims**

##### **(MPEP §2141.02)**

The difference between Watanabe et al. and the claimed invention is that Watanabe et al. teach the use of a hydrogen donor but do not specify that pressurized hydrogen can be used to hydrogenate the ketone compound.

#### **Finding of prima facie obviousness**

##### **Rational and Motivation (MPEP §2142-2143)**

Nonetheless, the instant claims are prima facie obvious in view of the teachings of Watanabe et al. in combination with Ikariya et al. The instant invention involves a simple substitution of one known element for another, i.e., pressurized hydrogen for a hydrogen donor.

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One having ordinary skill in the art at the time of the instant invention would have found it obvious to utilize pressurized H<sub>2</sub>, as taught by Ikariya et al., as the source of hydrogen in the process taught by Watanabe et al. because Ikariya et al. teach that it is known in the art that asymmetric hydrogenation of a carbonyl compound (which includes a ketone) can be accomplished using pressurized hydrogen or a hydrogen donor in the presence or absence of a base and a ruthenium complex. "A person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." KSR International Co. v. Teleflex Inc., 550 U.S.\_\_\_\_, 82 USPQ2d 1385, 1395-97 (2007). One having ordinary skill in the art would have found it obvious to utilize the hydrogen in combination with other hydrogen donors, including methanol and ethanol, since Watanabe et al. teach that hydrogen donors may be used singly or in combination. The ordinary skilled would have been further motivated to utilize the hydrogen in combination with an alcohol such as methanol or ethanol, since the methanol and ethanol can also act as a solvent in addition to its use as a hydrogen donor (see paragraph 0042 of Ikariya et al. and column 22, lines 42-43 of Watanabe et al.).

### ***Response to Arguments***

7. Applicant's arguments filed September 15, 2010 have been fully considered but they are not persuasive.

The Applicants submit that Ikariya teach a ruthenium complex where X and Y are not hydrogen can perform hydrogenation only in the presence of a base under pressurized hydrogen or in the presence of a hydrogen donor and makes reference to Examples 11-14.

This submission is not persuasive because a prior art disclosure is not limited to its working examples or to its preferred embodiments, but must be evaluated for what it teaches

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those of ordinary skill in the art. Merck & Co. Inc. v. Biocraft Labs. Inc., 874 F.2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir. 1989); In re Fracalossi, 681 F.2d 792, 794 n.1, 215 USPQ 569, 570 n.1 (CCPA 1982); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976); In re Boe, 355 F. 2d 961, 965, 148 USPQ 507, 510 (CCPA 1966). In the instant case Ikariya teach use a ruthenium complex wherein X and Y can be a hydrogen atom, halogen atom, and a carboxyl group or other anion groups for the hydrogenation of a carbonyl compound with hydrogen or a compound which supplies hydrogen. The method can take place in the absence of a base (see for example claims 21-32) or in the presence of a base (see for example claim 34).

The Applicants submit that Ikariya teach that a metal complex having a halogen on ruthenium must be treated with a base, such as 2-propanol, in advance for the Complex to be capable of reducing ketones without a base under hydrogen gas.

This submission is not persuasive because 1) 2-propanol is not a base and 2) as discussed above a prior art disclosure is not limited to its working examples or to its preferred embodiments, but must be evaluated for what it teaches those of ordinary skill in the art. Merck & Co. Inc. v. Biocraft Labs. Inc., 874 F.2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir. 1989); In re Fracalossi, 681 F.2d 792, 794 n.1, 215 USPQ 569, 570 n.1 (CCPA 1982); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976); In re Boe, 355 F. 2d 961, 965, 148 USPQ 507, 510 (CCPA 1966). In the instant case Ikariya teach use a ruthenium complex wherein X and Y can be a hydrogen atom, halogen atom, and a carboxyl group or other anion groups for the hydrogenation of a carbonyl compound with hydrogen or a compound which supplies hydrogen. In the instant case Ikariya teach that the method can take place in the absence of a base (see for example claims 21-32) or in the presence of a base (see for example claim 34). There is no requirement that a metal complex having a halogen on ruthenium must be treated

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with a base, such as 2-propanol, in advance for the Complex to be capable of reducing ketones without a base under hydrogen gas.

The Applicants submit that Watanabe in view of Haack teaches that an amide complex can hydrogenate a carbonyl compound only by reacting with a hydrogen donor, such as 2-propanol, and not hydrogen gas.

This submission is not persuasive because 1) the rejection is not based upon Watanabe in view of Haack ; 2) nowhere in Watanabe it is disclosed that the amide complex reacts with 2-propanol to form a hydride complex and the hydride complex asymmetrically reduces ketones to form back into an amide complex; and 3) Ikariya is used to show that the hydrogen donor of Watanabe can be replaced with pressurized hydrogen and there is a reasonable expectation of success, since Ikariya et al. teach that it is known in the art that asymmetric hydrogenation of a carbonyl compound (which includes a ketone) can be accomplished using pressurized hydrogen or a hydrogen donor in the presence or absence of a base and a ruthenium complex.

The Applicants submit that Fujii teaches that an amide complex cannot hydrogenate a carbonyl compound in hydrogen gas.

This submission is not persuasive because Fujii teach that gaseous hydrogen participates little in the alcohol formation, but Fujii does not teach that an amide complex **cannot** hydrogenate a carbonyl compound in hydrogen gas.

The Applicants submit that Watanabe and Ikariya teach an amide complex, a hydride complex or a ruthenium complex and they do not teach a metal complex comprising a dissociative anionic group such as halogen group on a ruthenium.

This submission is not persuasive because Watanabe teaches that with regard to the complex in which the optically active nitrogen-containing compound coordinates to the metal



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atom belonging to group VIII of the periodic table, there can be cited a **chloride** complex, an amide complex, a hydride complex, etc. (see column 20, line 35 to column 21, line 55).

The Applicants submit that the applied references do not disclose any of the recited ketone compounds.

This submission is not persuasive because Watanabe discloses and/or suggests the recited ketone compounds at column 4, line 49 to column 5, line 11).

The Applicants submit that Watanabe and Ikariya merely teach an amide complex, a hydride complex, or a ruthenium complex that does not contain a dissociative anionic group X.

This submission is not persuasive because Watanabe teaches that with regard to the complex in which the optically active nitrogen-containing compound coordinates to the metal atom belonging to group VIII of the periodic table, there can be cited a **chloride** complex, an amide complex, a hydride complex, etc. (see column 20, line 35 to column 21, line 55); and Ikariya teaches that X and Y can be the same or different and selected from a hydrogen atom, a halogen atom, and a carboxyl group or other anion group (see for example paragraph 0008).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosalynd Keys whose telephone number is (571)272-0639. The examiner can normally be reached on M-F 5:30 am-7:00 am and 9:00 am-3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rosalynd Keys/  
Primary Examiner, Art Unit 1621  
December 13, 2010